



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/954,753	09/18/2001	David B. Marshall	7784-000314	8505

7590 08/27/2002

Mark D. Elchuk  
Harness Dickey & Pierce P.L.C.  
P.O. Box 828  
Bloomfield Hills, MI 48303

EXAMINER
----------

EDMONDSON, LYNNE RENEE

ART UNIT	PAPER NUMBER
----------	--------------

1725

3

DATE MAILED: 08/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/954,753

Applicant(s)

MARSHALL ET AL.

Examiner

Lynne Edmondson

Art Unit

1725

-- Th MAILING DATE of this communication appears on the cover sheet with the corresponding address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 18 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-6 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Li (USPN 5874175).

Li teaches a joint assembly whereby a ceramic matrix composite conduit (cylinder) is joined to a metal conduit (cylinder) through an insert (brazing disc) material (col 5 lines 41-43, col 13 lines 1-32 and lines 49-58). As the parts are cylinders they have circular cross sections however process works with any size and shape of workpiece (col 2 lines 5-25 and col 16 lines 30-33). The parts are joined by brazing (col 13 line 49 – col 14 line 19). The ceramic matrix is reinforced with carbon fibers (col 14 lines 30-38). The matrix comprises silicon carbide (col 35 lines 19-54 and col 36 lines 42-50). The matrix substrate may comprise a fiber preform (col 24 lines 28-35, col 32 lines 33-55) infiltrated with a ceramic slurry (coating) (col 32 lines 56-67). See also Li claims 1-13, 21-27 and 41-46.

2. Claims 1, 2, 5, 7, 9 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by MacLean et al. (USPN 5231833).

Art Unit: 1725

MacLean teaches a joint assembly for a rocket (turbine) nozzle (col 2 lines 55-68) and manifold (col 3 lines 18-28) whereby a ceramic matrix composite conduit (tube, 62, col 4 lines 22-47) is joined to a metal conduit (manifold tube 58, col 3 line 55 - col 4 line 16) through a monolithic ceramic insert (60) with a different thermal expansion (col 5 lines 9-64). The parts have circular cross sections (figure 3). The ceramic matrix is a preform (prepeg) infiltrated with a liquid (col 4 lines 42-56). Multiple conduits (tubes) are joined (col 3 line 60 – col 4 line 13). It is noted that parts of the assembly are joined by brazing (col 6 lines 8-18). See also MacLean claims 1-6.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4, 6, 8, 10-15, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacLean et al. (USPN 5231833) in view Tuffias et al. (USPN 5855828).

MacLean teaches a joint assembly for a rocket (turbine) nozzle (col 2 lines 55-68) and manifold (col 3 lines 18-28) whereby a ceramic matrix composite conduit (tube, 62, col 4 lines 22-47) is joined to a metal conduit (manifold tube 58, col 3 line 55 - col 4 line 16) through a monolithic ceramic insert (60) with a different thermal expansion (col

Art Unit: 1725

5 lines 9-64). The parts have circular cross sections (figure 3). The ceramic matrix is a preform (prepeg) infiltrated with a liquid (col 4 lines 42-56). Multiple conduits (tubes) are joined (col 3 line 60 – col 4 line 13). It is noted that parts of the assembly are joined by brazing (col 6 lines 8-18). However, there is no disclosure of carbon fibers, the coating material or the type of ceramic in the matrix and insert.

Tuffias teaches rocket nozzle materials (col 1 lines 10-17 and col 1 line 65 – col 2 line 20) wherein a ceramic is joined metal (col 6 lines 30-59). The ceramic matrix composite comprises a carbon fiber reinforced (col 4 lines 51-58) silicon carbide preform (col 8 line 64 – col 9 line 5). The metal (22) is joined to the ceramic through an insert (coating, 30) comprising silicon nitride (col 9 lines 38-64 and col 8 lines 30-58). The ceramic preform is infiltrated with a ceramic precursor slurry (col 13 lines 1-14 and col 7 line 66 – col 8 line 20).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ a silicon carbide matrix and silicon nitride insert as both are known turbine materials with high strength able to withstand high temperatures without coking fuel while reducing size and weight of the engine (MacLean, col 2 lines 1-15).

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cox et al. (USPN 6418973, nozzle, manifold, SiC, Si<sub>3</sub>N<sub>4</sub>), Alvin et al. (USPN 6290743 B1, ceramic and metal conduits joined through inserts), Metcalfe

Art Unit: 1725

et al. (USPN 4642864, ceramic and metal conduits joined through ceramic insert), Kang et al. (USPN 5108025, ceramic and metal conduits joined through inserts, brazed), Bothwell (USPN 4376374, slurry, SiC), Steckert et al. (USPN 5681511, SiC, Si<sub>3</sub>N<sub>4</sub>), Ritland et al. (USPN 6394281 B2), Vuillamy et al. (USPN 5438834) and Barringer et al. (USPN 5230306).

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (703) 306-5699. The examiner can normally be reached on M-F from 7-4 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7118 for regular communications and (703) 305-7115 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

Lynne Edmondson  
Examiner  
Art Unit 1725

A handwritten signature in cursive script, appearing to read 'Lynne Edmondson', followed by the date '8/22/02'.

LRE  
August 22, 2002